The Impacts of Polluted Stormwater and Ordinance Provisions That Can Minimize Those Impacts

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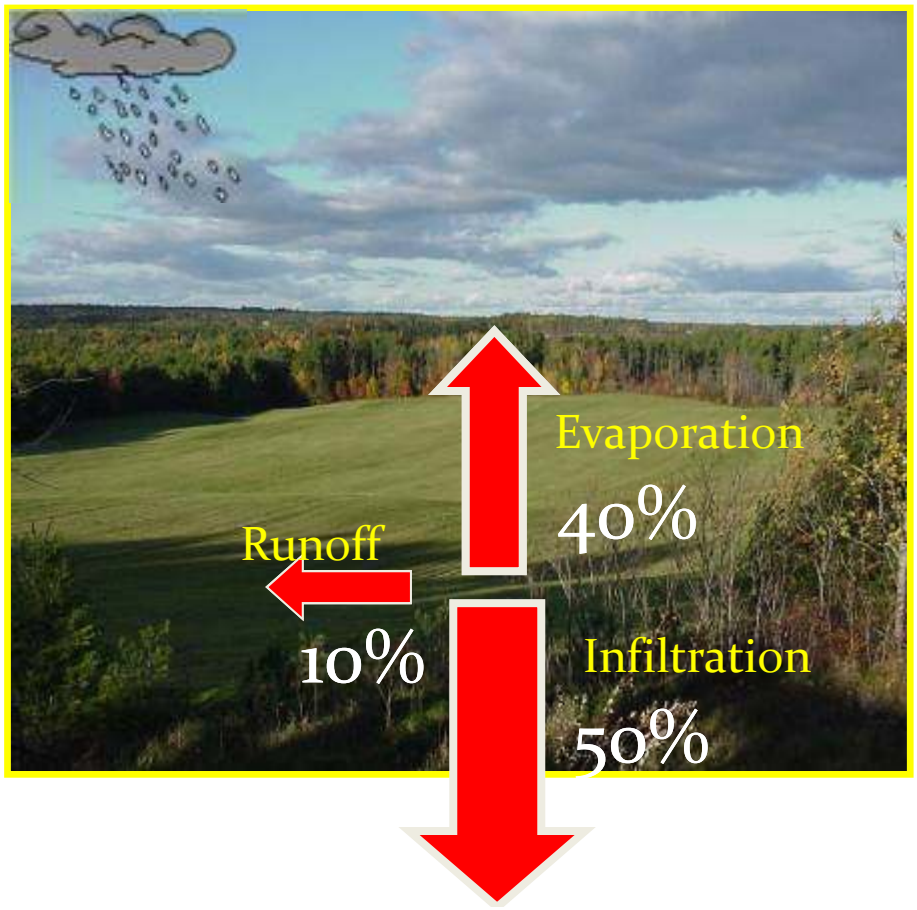
Office of The Commissioner


DIE WINTER..DIE!!


When it rains, pollution happens

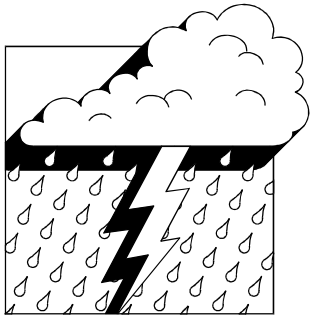
Maine ‘s Water Budget
Impacts From Development

Natural Cover



75-100% Impervious Surface

Traditional Development Pushes rain off the site



Development Impacts on Water Quality

Increased quantity

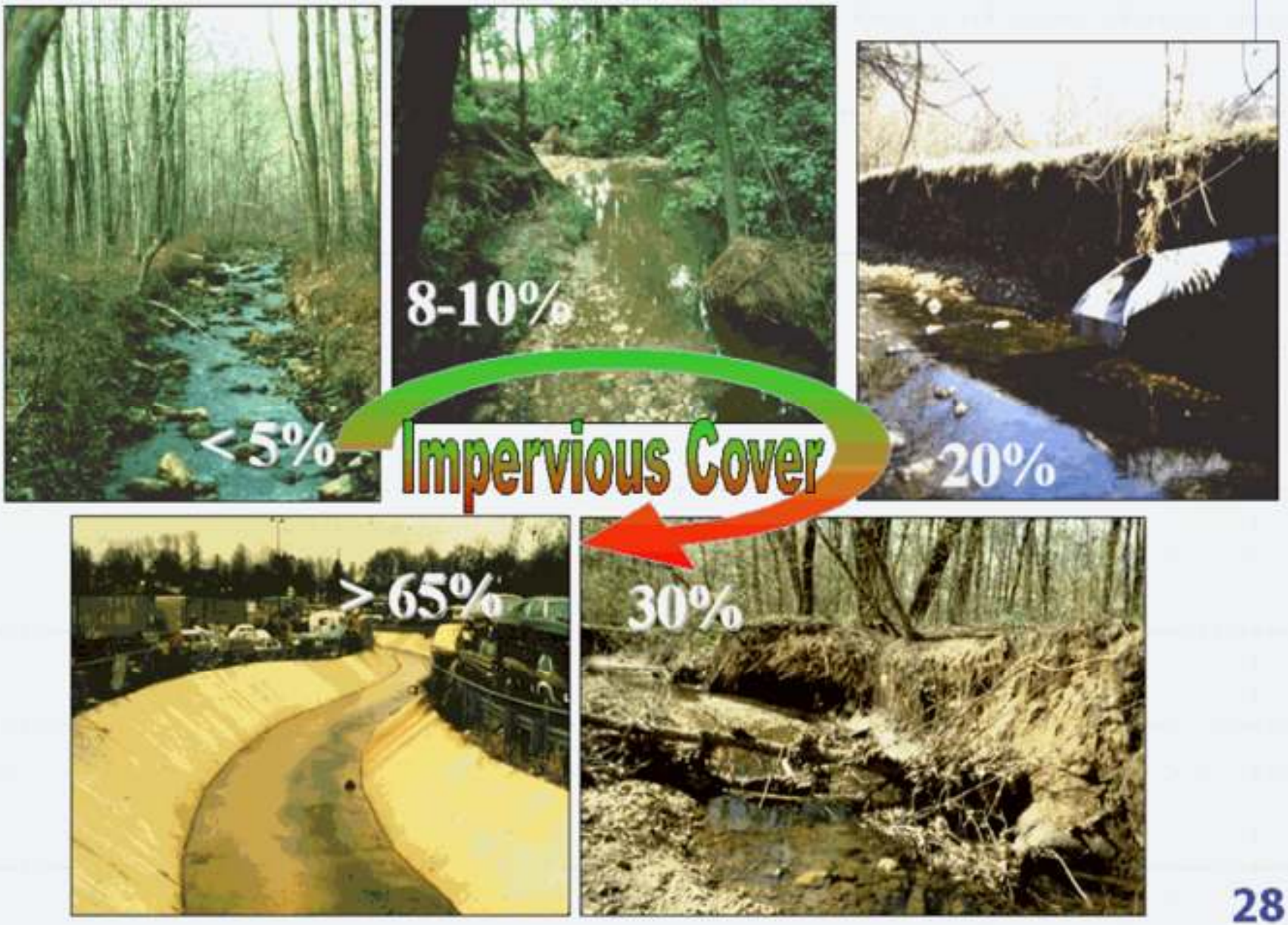
Decreased quality

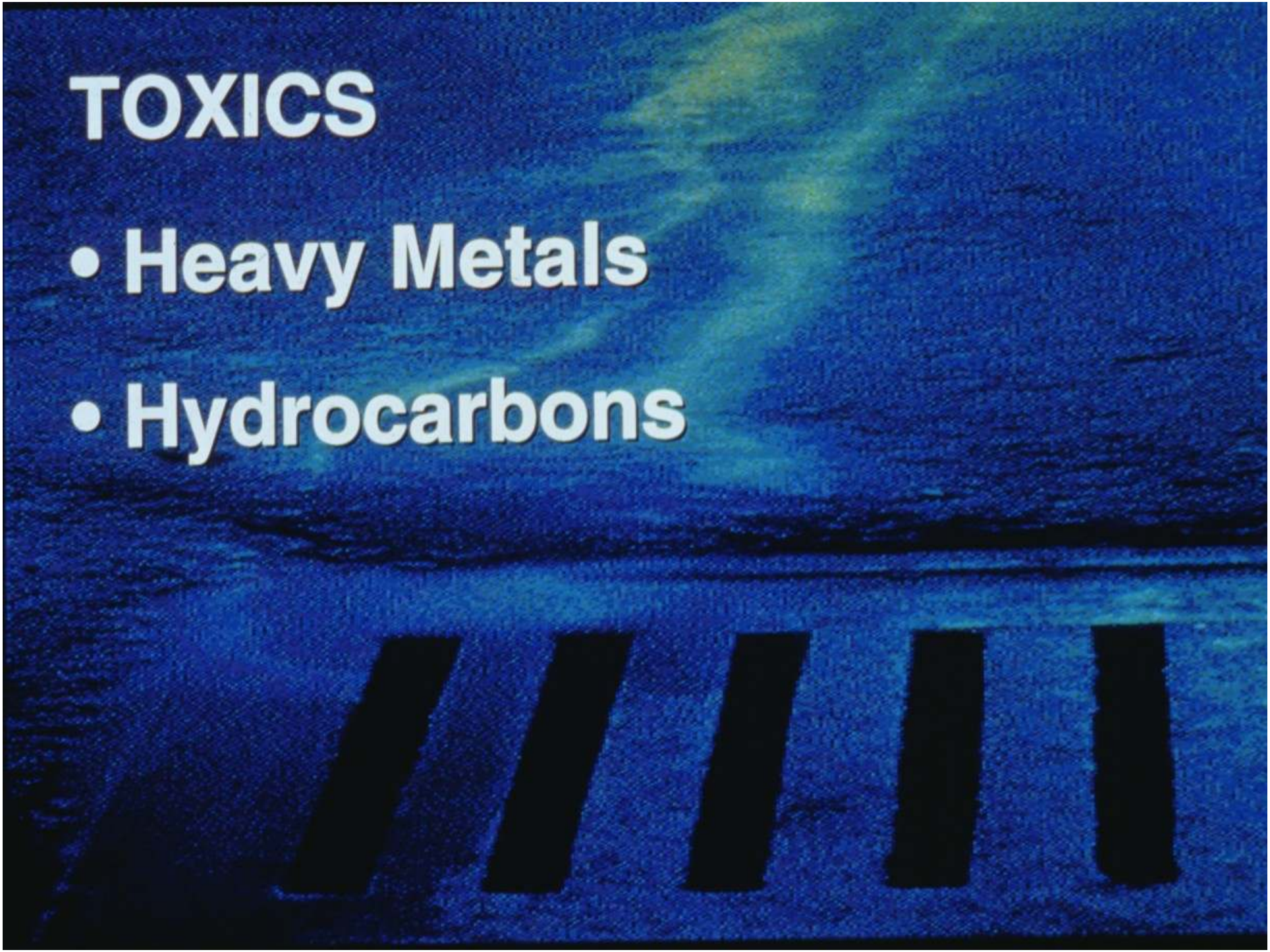
Development Impacts on Water Quality

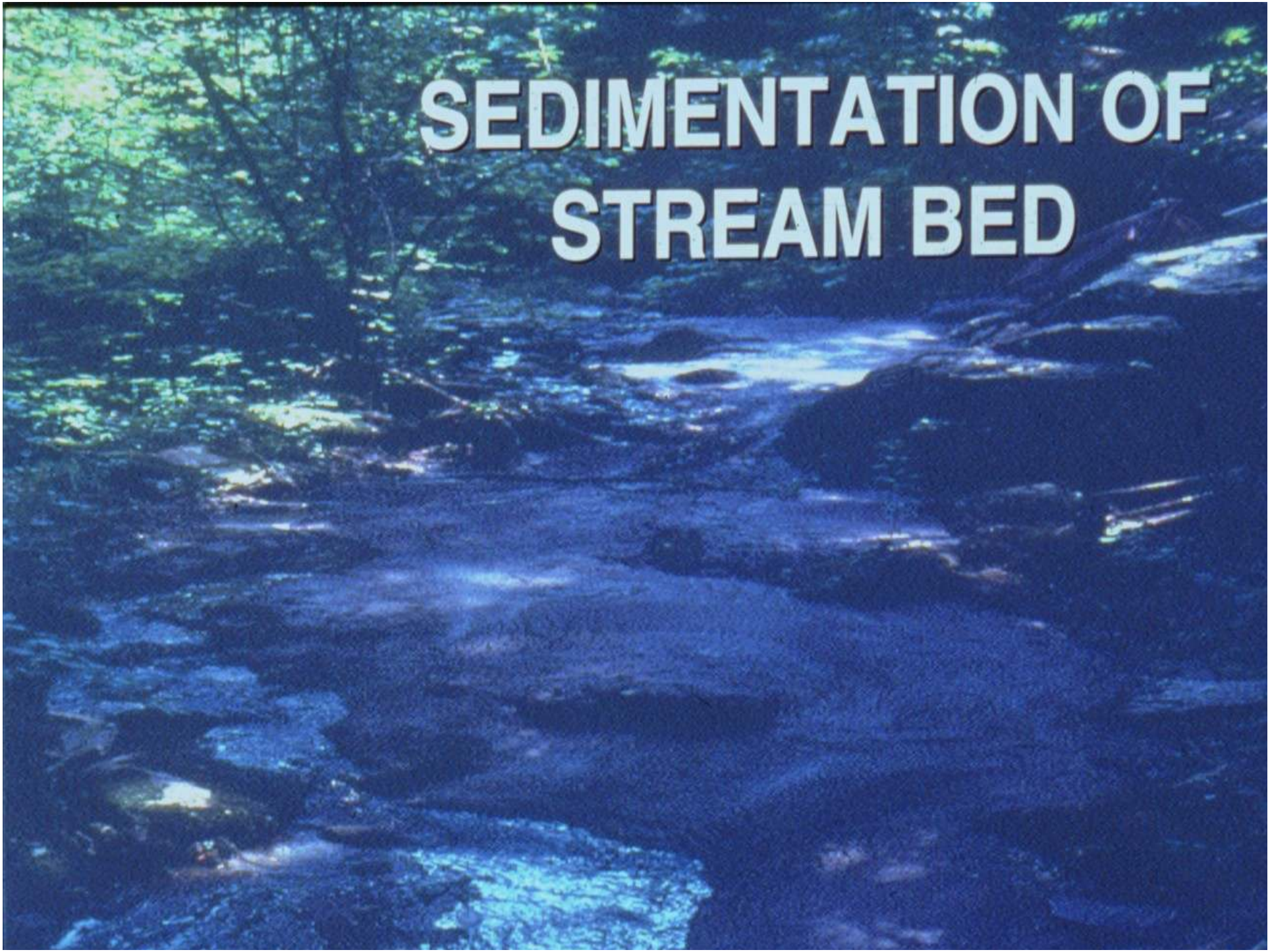
Increased quantity

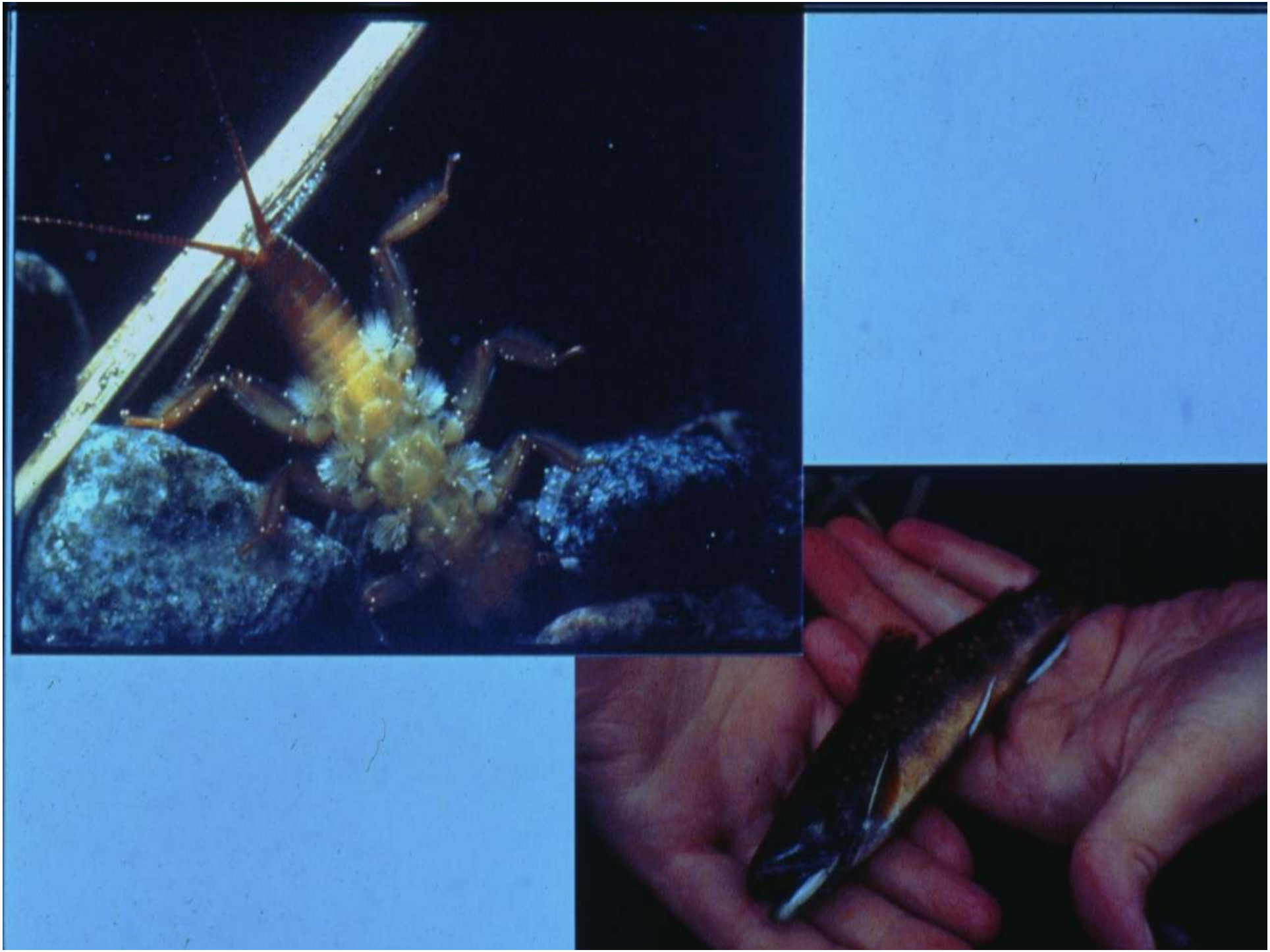
Decreased ground water levels

IC and Stream Habitat

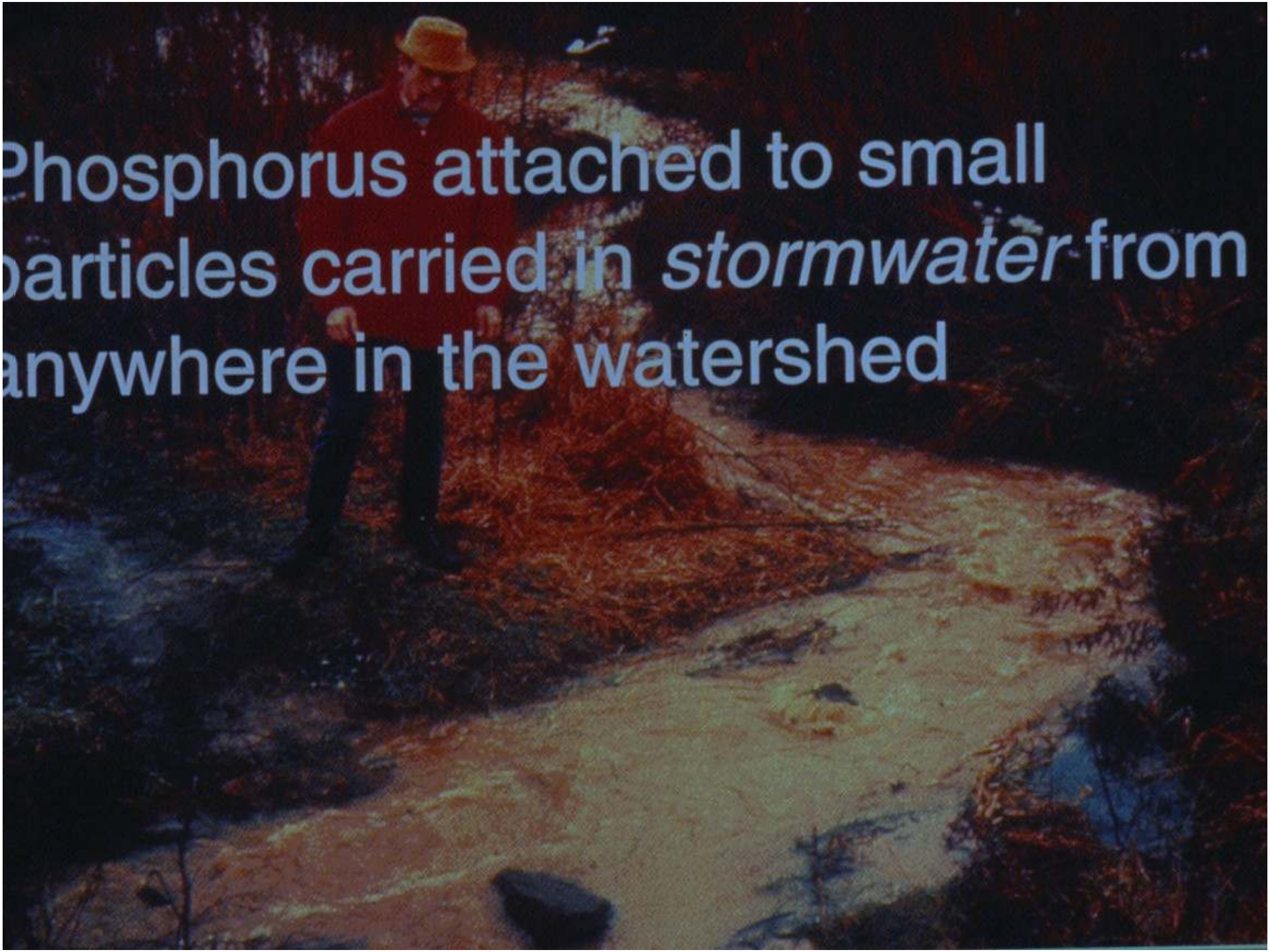



TOXICS
• Heavy Metals
• Hydrocarbons

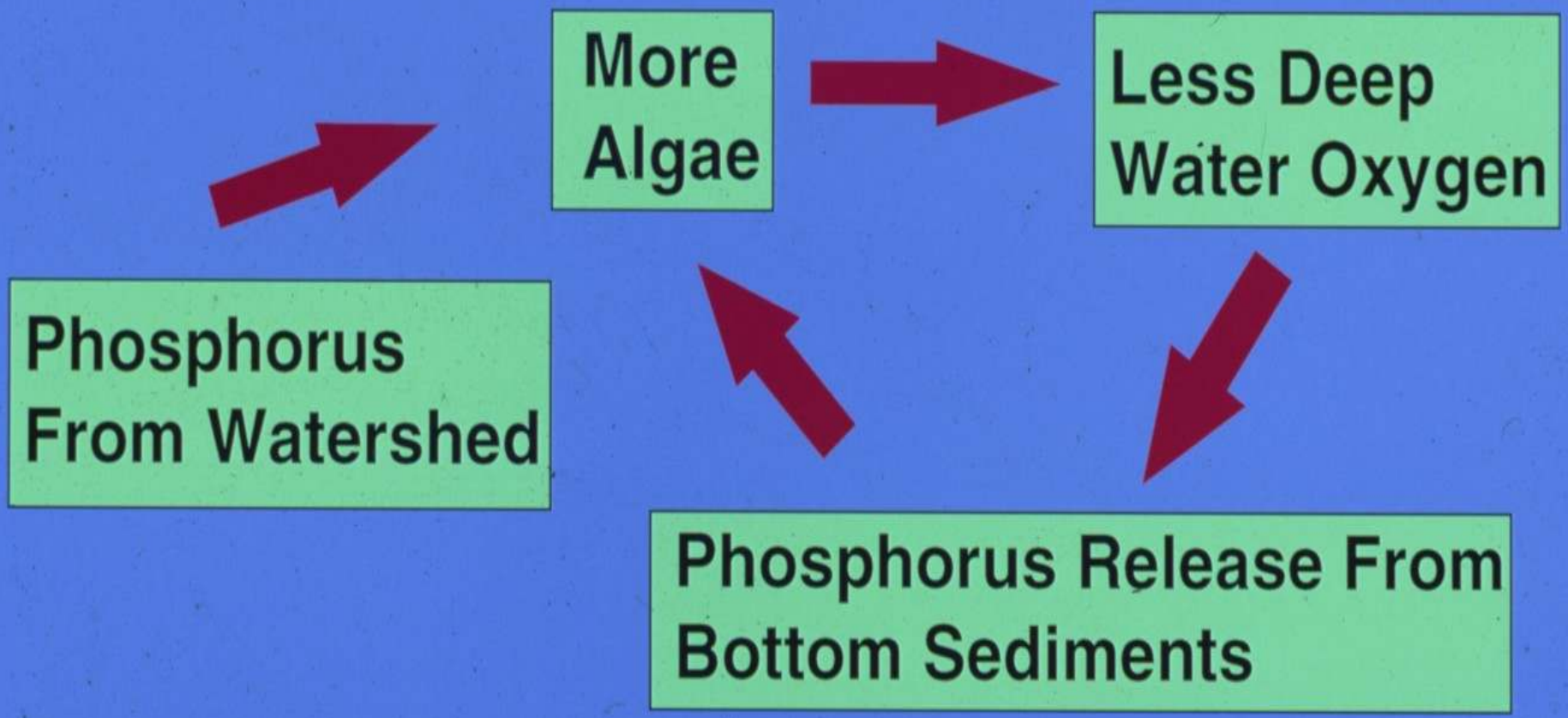

SEDIMENTATION OF
STREAM BED

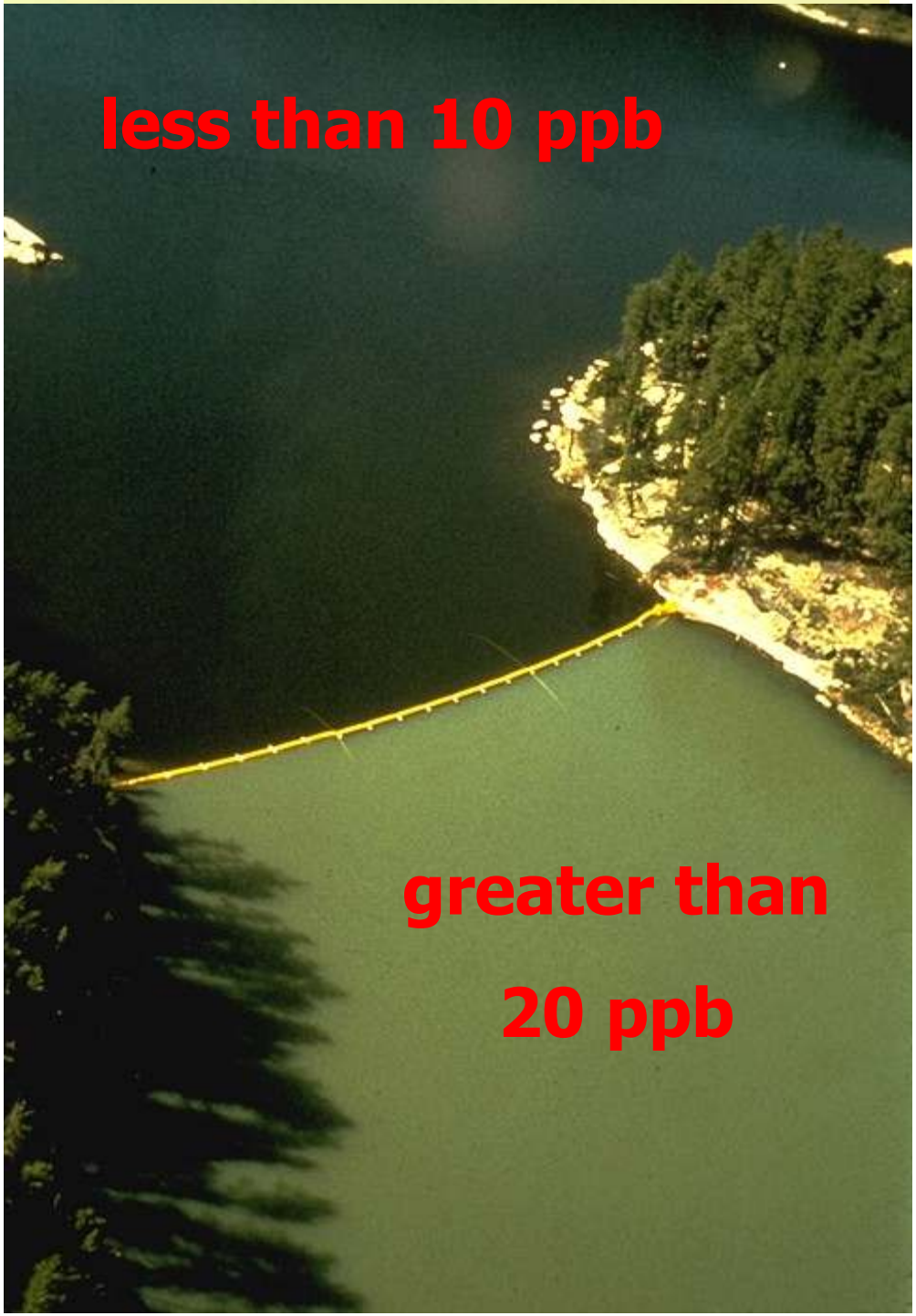


Nutrients


Phosphorus attached to small
particles carried in *stormwater* from
anywhere in the watershed

PHOSPHORUS FROM SEDIMENTS

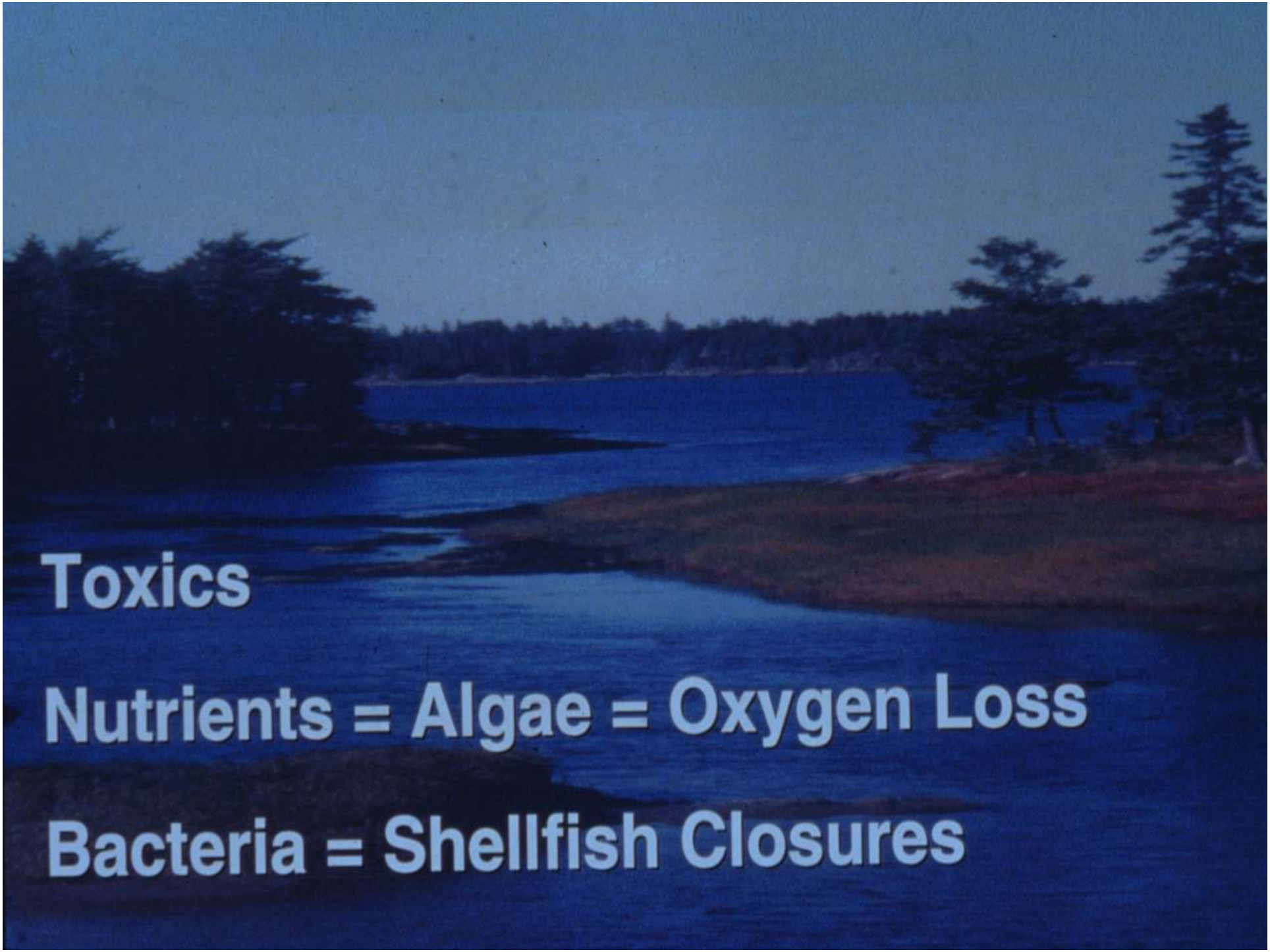


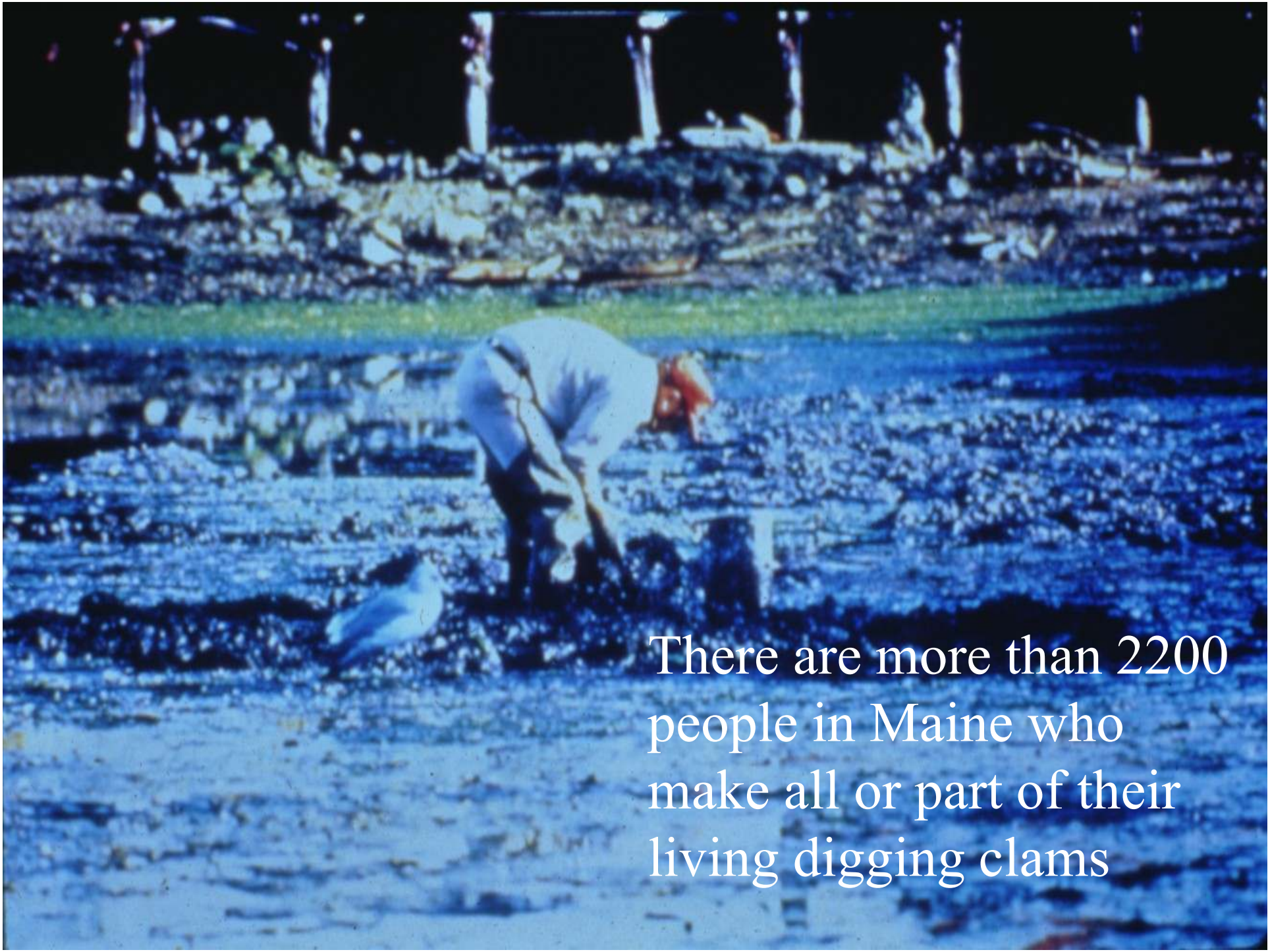


Canadian Experimental Lakes Area (#226)

- Pristine lake divided in two
- P added to only one side

Source: ELA, Fisheries and Oceans Canada


Toxics
Nutrients = Algae = Oxygen Loss
Bacteria = Shellfish Closures


There are more than 2200
people in Maine who
make all or part of their
living digging clams

Impacts of Stormwater Pollutants

- Toxicity
  - stormwater kills test organisms 8-10 days
- Sediment
  - smothering habitats
  - adsorbed pollutants
  - lake/reservoir storage
- Oil and Grease
  - toxic substrates
  - hydrocarbons
- Algal Blooms
  - fish kills
  - odor and taste problems
  - human health
- Bacteria
  - pathogens
  - fishable/swimable
  - Shellfish closures

To Minimize Impacts From Polluted Stormwater on Habitat and Water Quality, Municipalities can Adopt Low Impact Development Standards

Low-Impact Development (LID)—

- Retain the natural landscape
- Reduce impervious surfaces
- Emphasize on-site drainage of stormwater
- Encourage riparian buffers
- Require proper septic system placement, design, and maintenance
- Require stormwater management plans

York Ordinance Language 2007

Low Impact Design. Each applicant is *required* to *submit a statement* to the Planning Board *documenting proposed* Low Impact Design (LID) *for the site,* which will help to reduce stormwater volumes and help to enhance stormwater quality. LID includes, but *is* not limited to green roofs, rain gardens, tree wells, infiltration basins, and permeable pavement. The applicant shall submit technical documentation about the suitability of such designs with the request for LID features.

South Portland

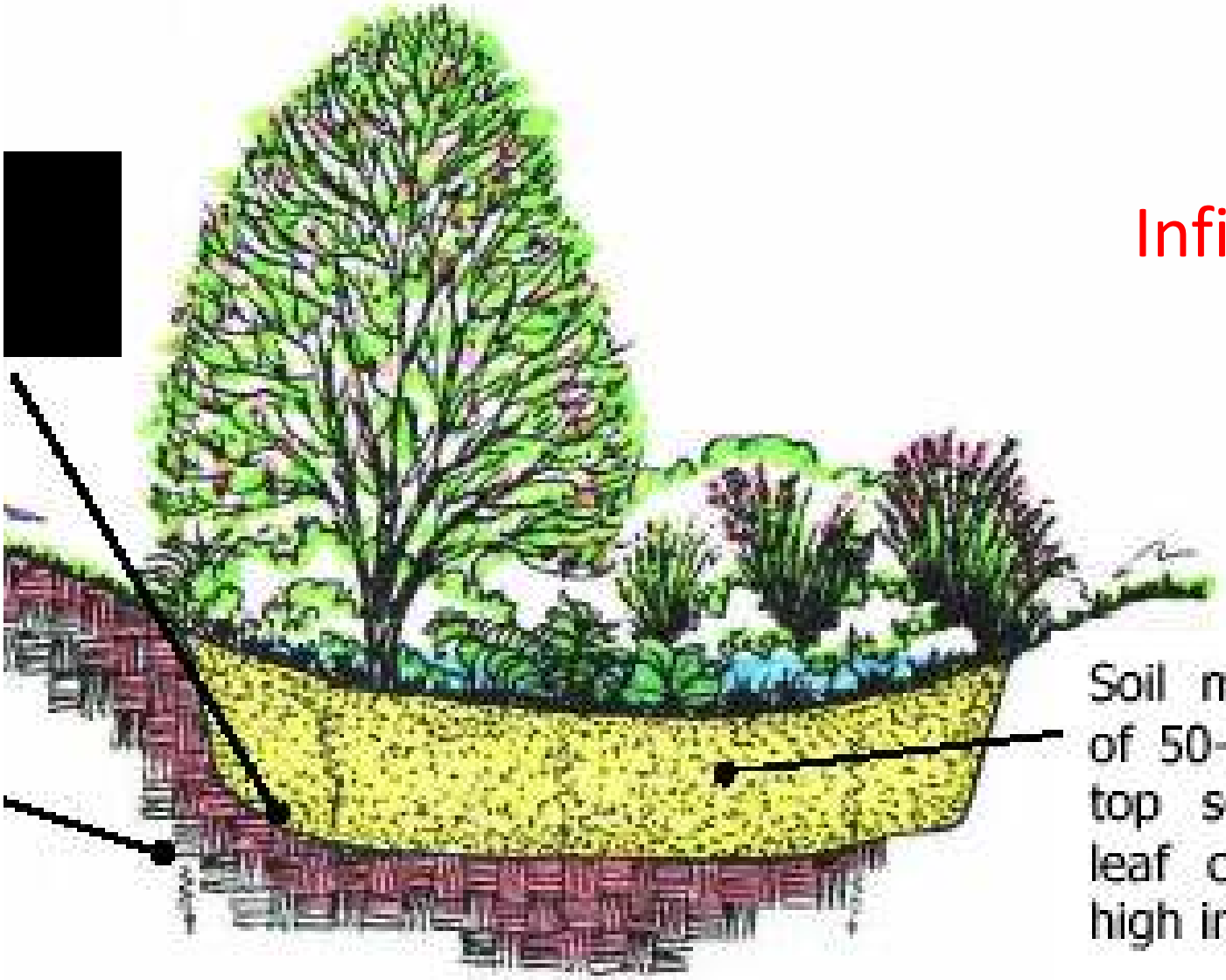
Promoting Small-Lot Stormwater Treatment Practices at the Municipal Level

Low Impact Development

Treat rainfall close to where it falls

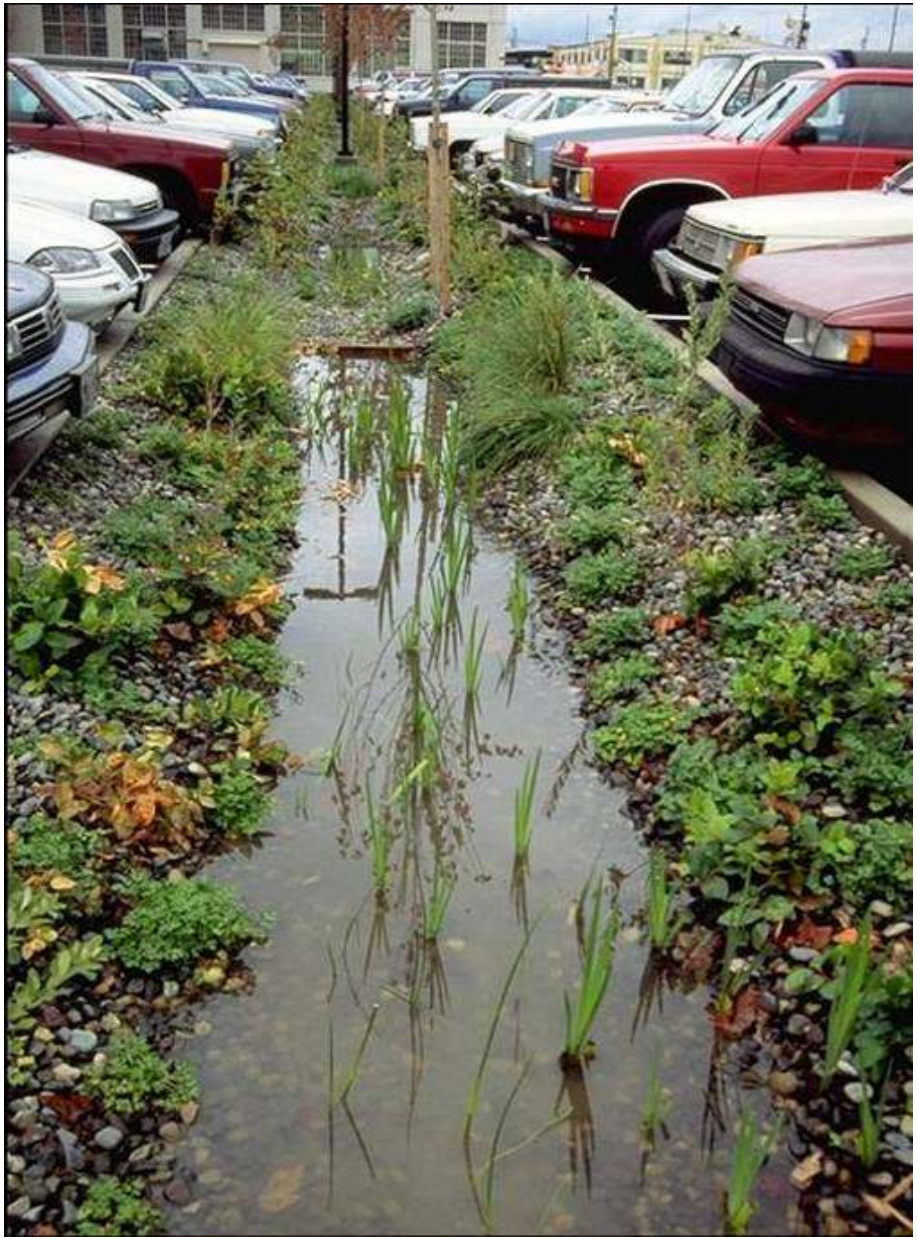
Roof Runoff is very clean- soak it back into the ground!

Infiltration areas

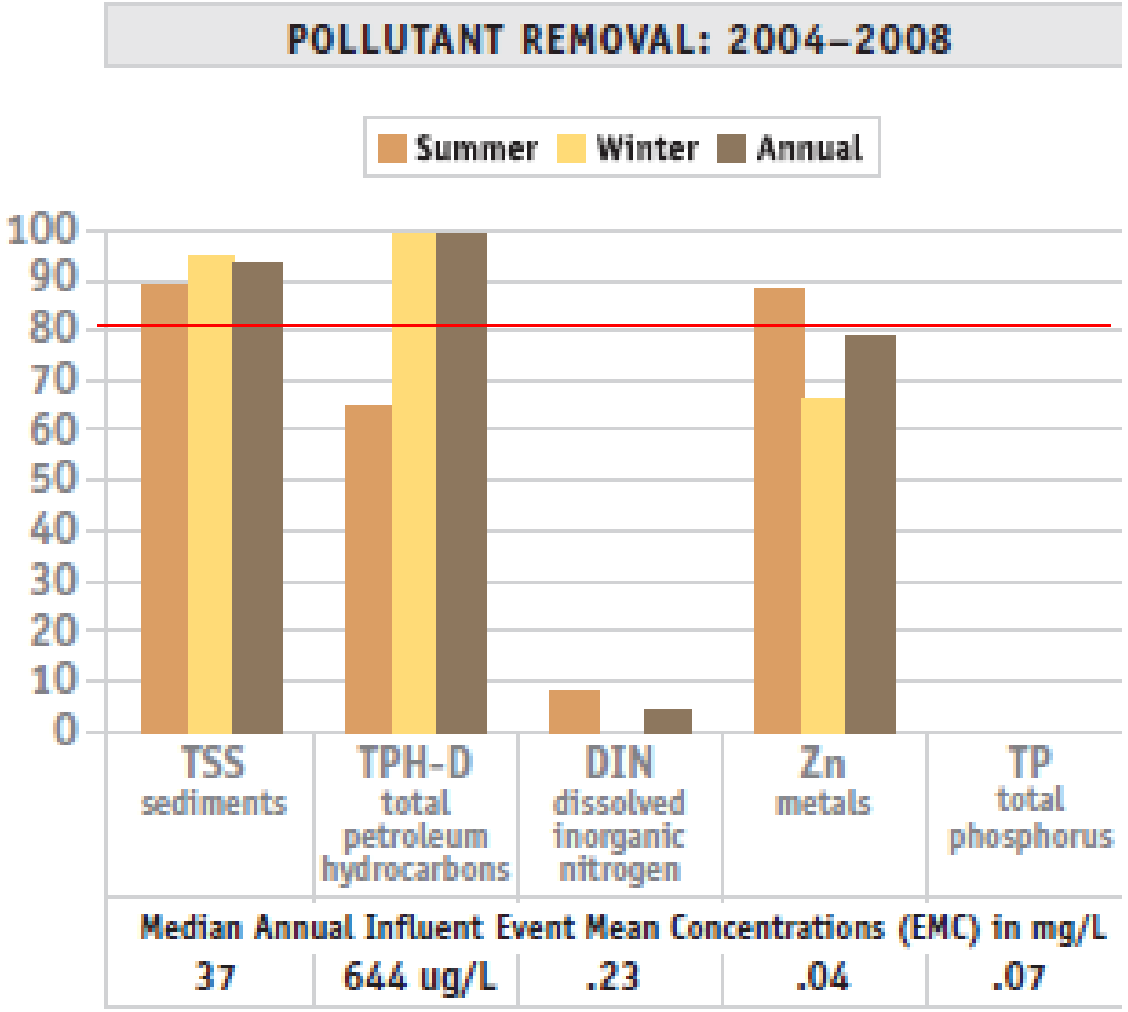


Soil medium consisting of 50-60% sand, 20-30 top soil, and 20-30% leaf compost allows a high infiltration capacity

Infiltration/Recharge Facility (enhanced infiltration)



Tree Box Filter



Subsurface Gravel Wetland

Rain Gardens

Back Cove Rain Garden

Orono Rain garden

Infiltration Steps soak in the water

Porous concrete York Hospital

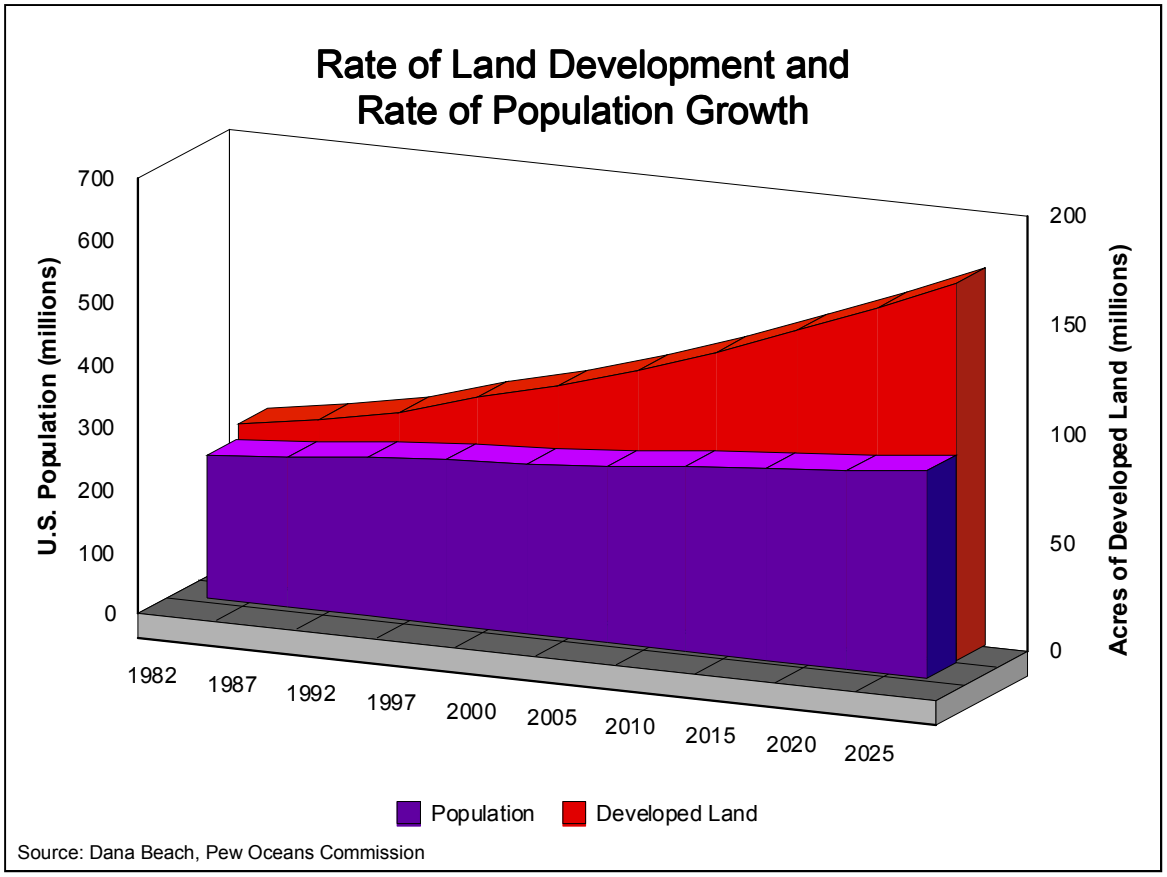
Green Roofs

Rockland Green roof

More land is used per person with new development

- ***more than 1/4th of all the land converted from rural to urban and suburban uses since European settlement occurred in only 15 years.***

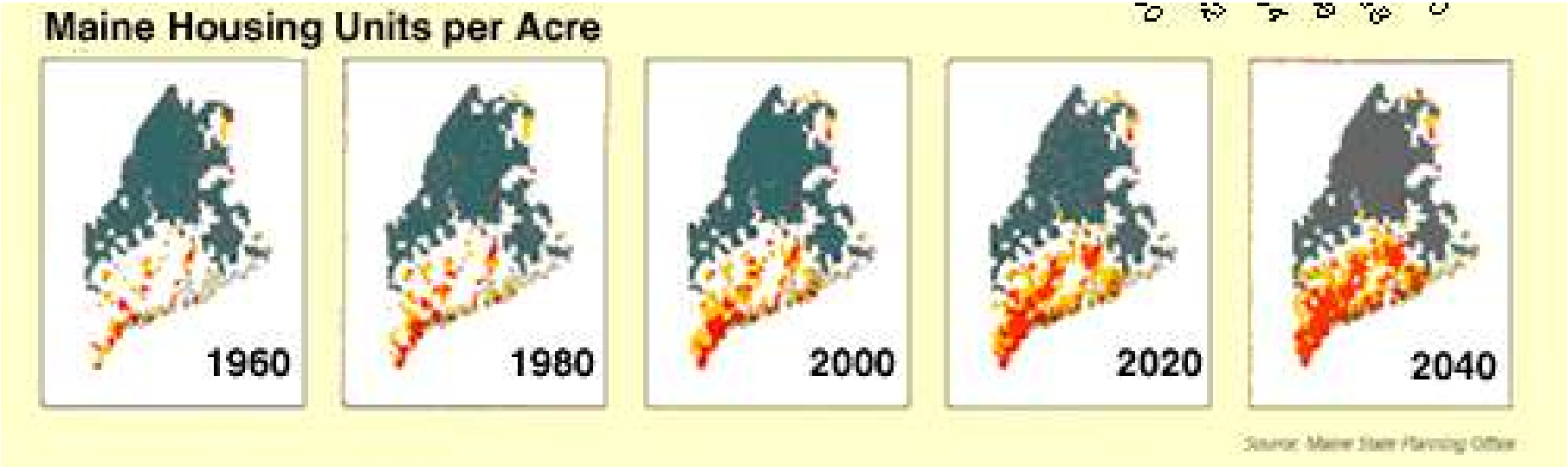
1982-1997

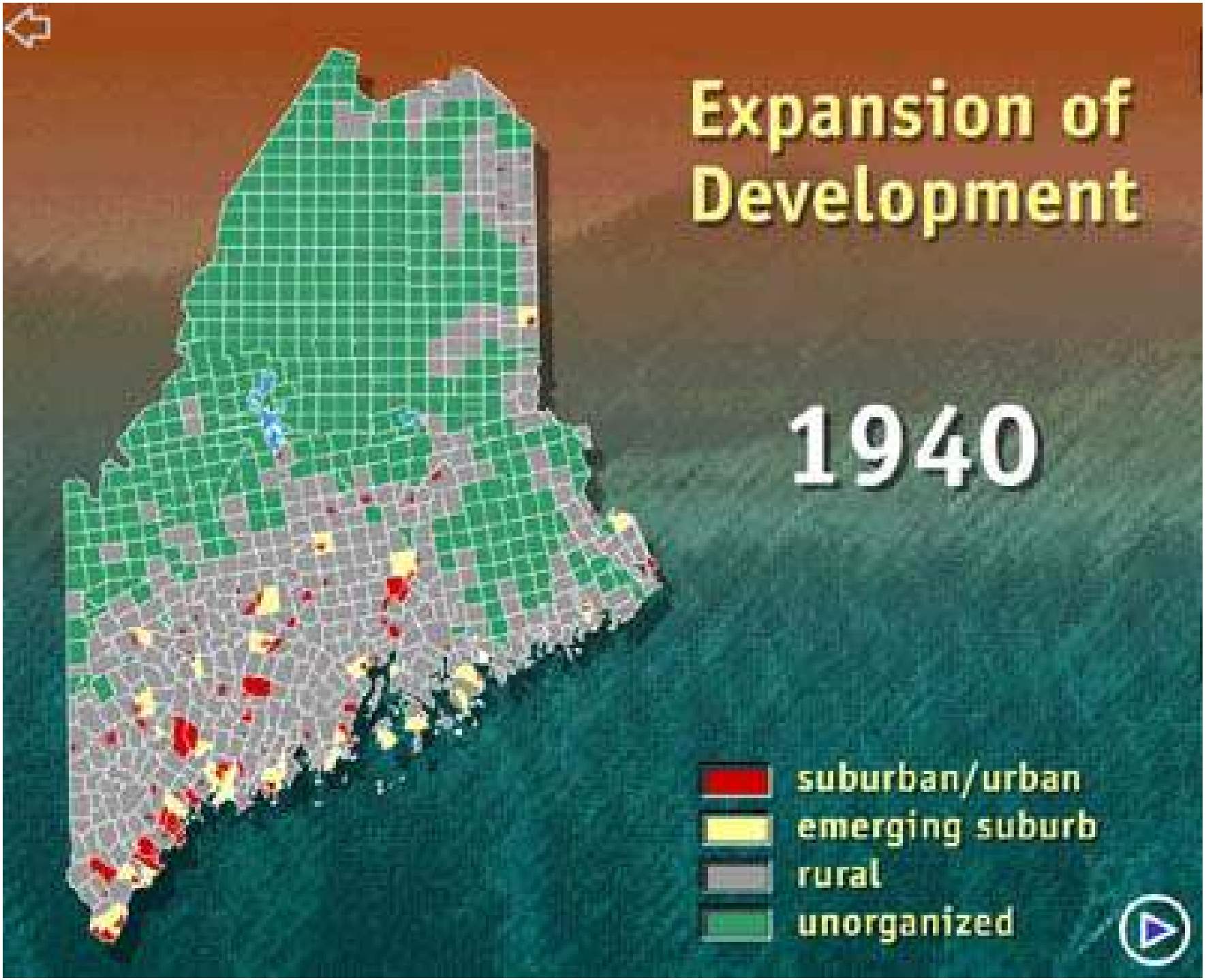


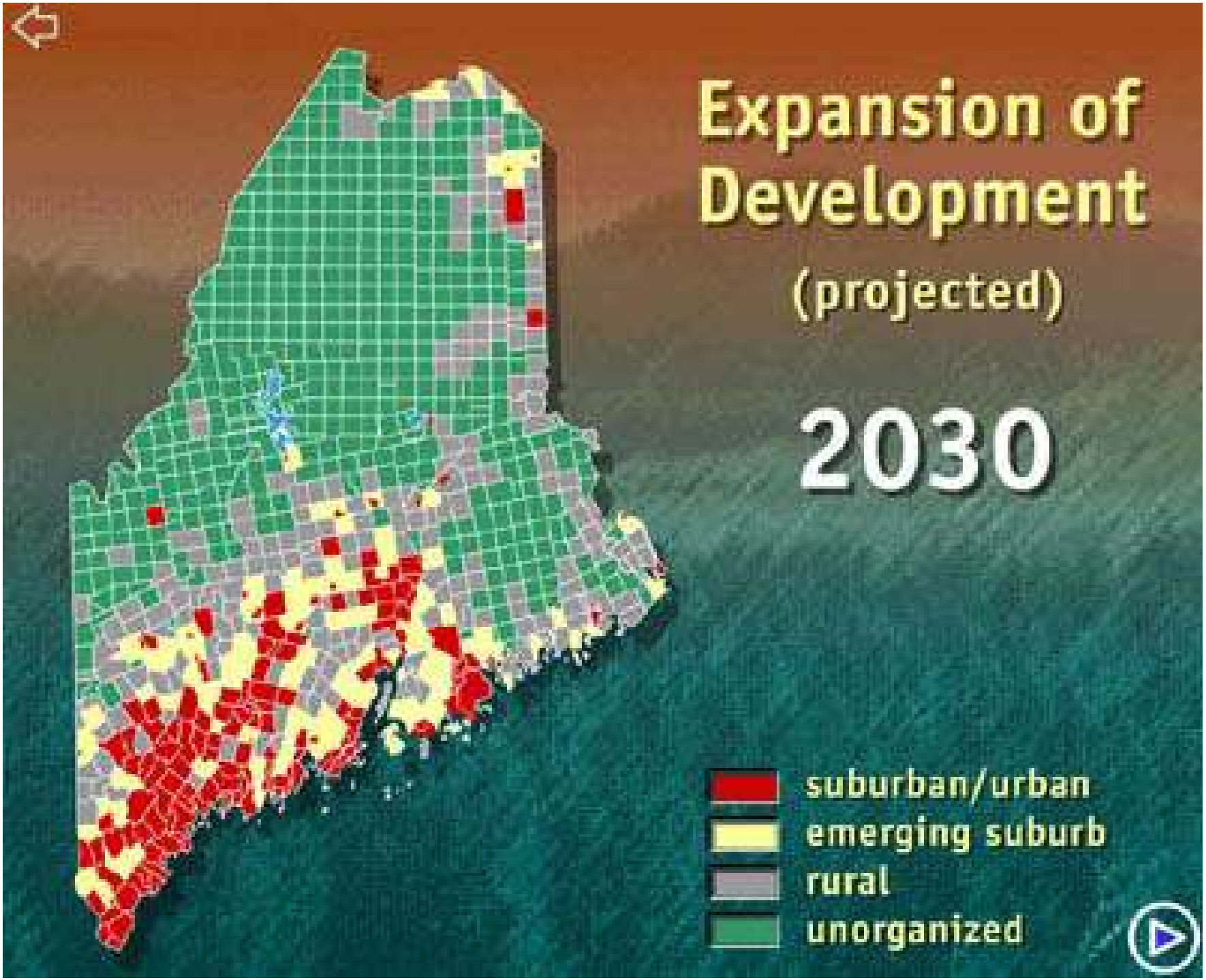

What does growth look like?
2 Acre Residential
0.21 acres impervious area per house

Carving Up the Landscape

Growth in Maine




Expansion of Development
1940
suburban/urban
emerging suburb
rural
unorganized


Expansion of Development
(projected)
2030
suburban/urban
emerging suburb
rural
unorganized

How do towns deal with growth?

Good Planning:

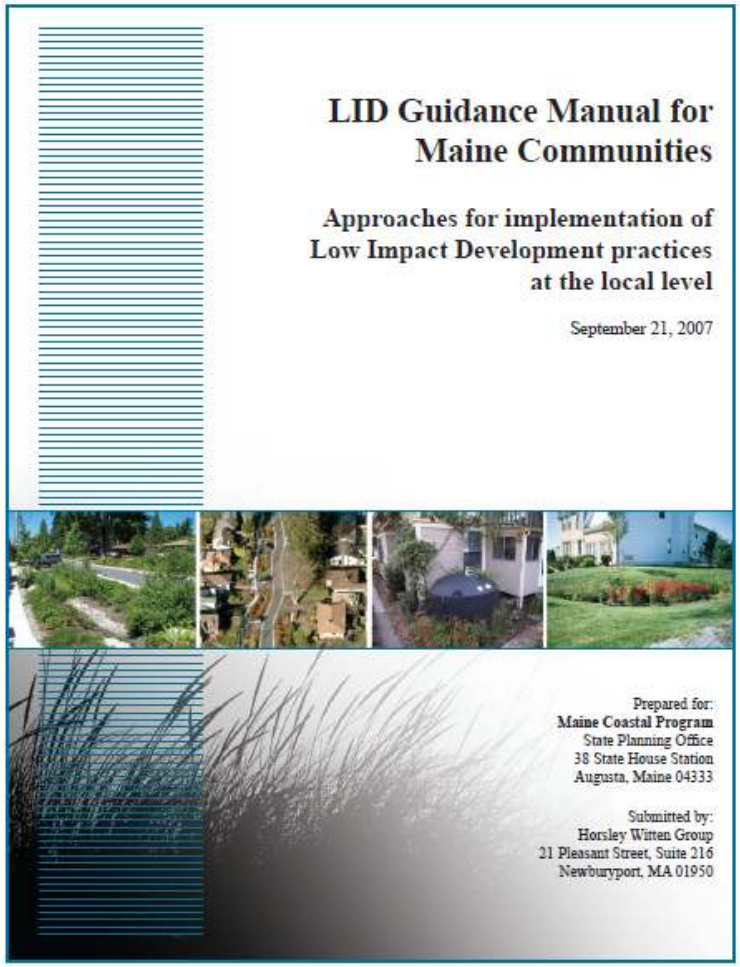
Using Density to protect natural resources

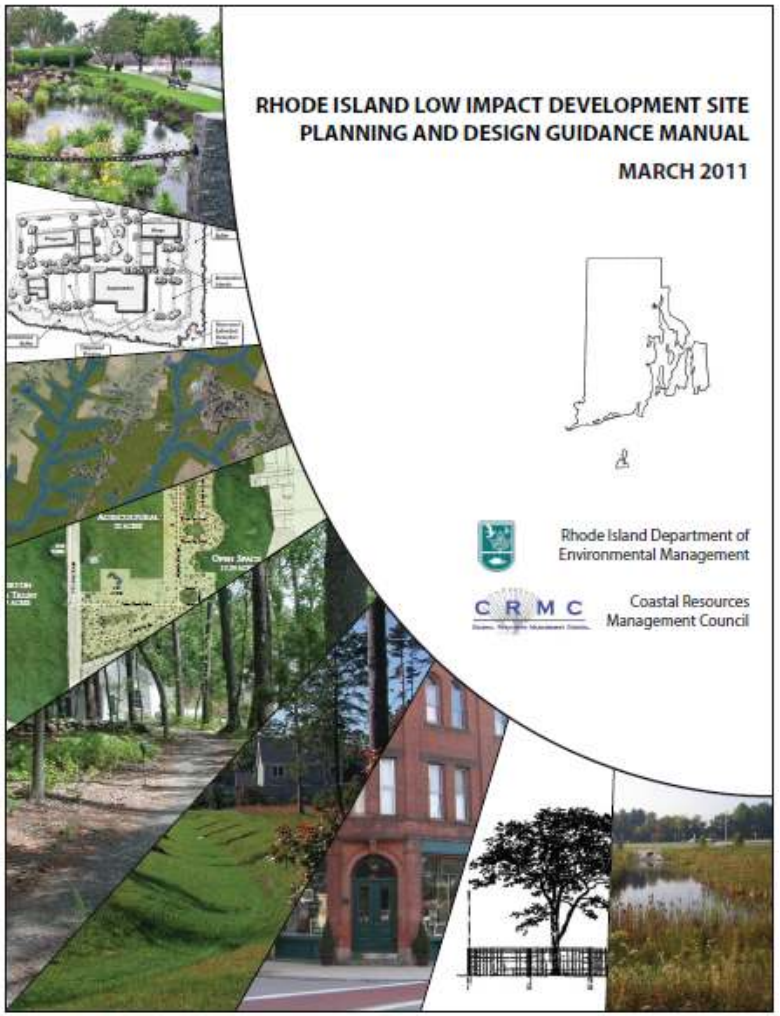
Action:

- Zoning
- Site Design
- BMP's and Remediation

Density is a BMP

SPO Model Ordinance 2007



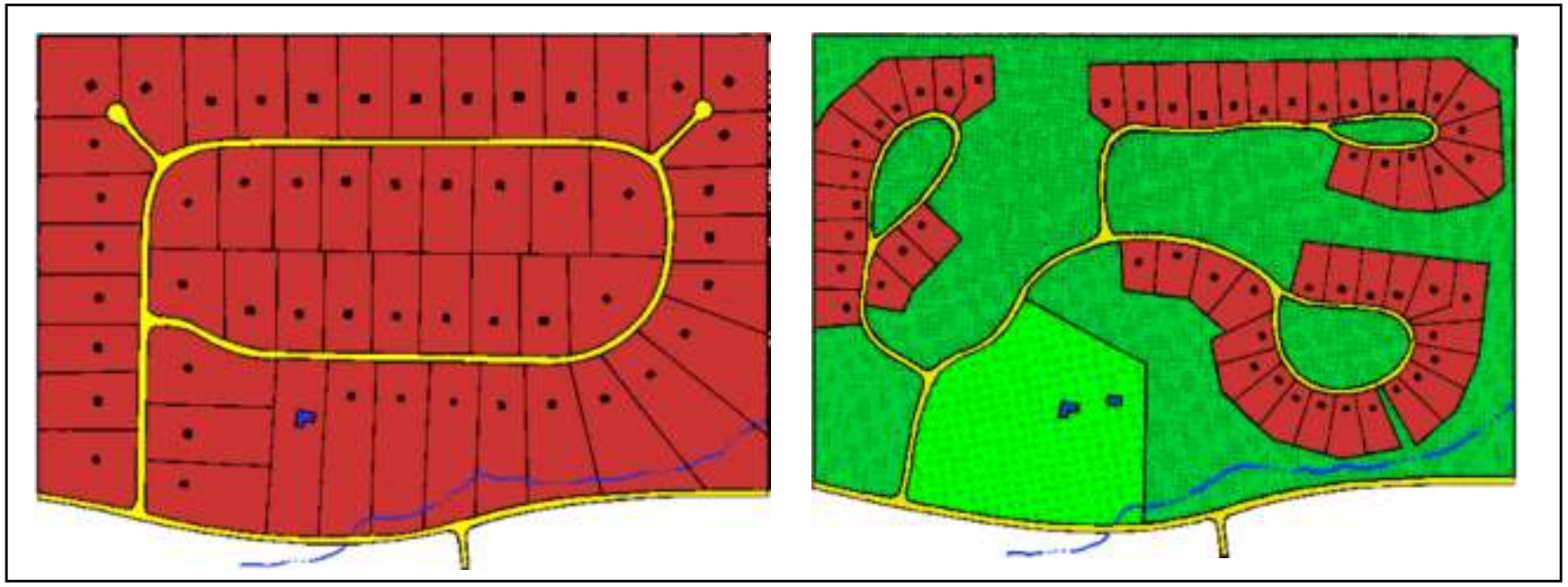


Town of York Zoning Ordinance

Concerning Cluster Subdivisions

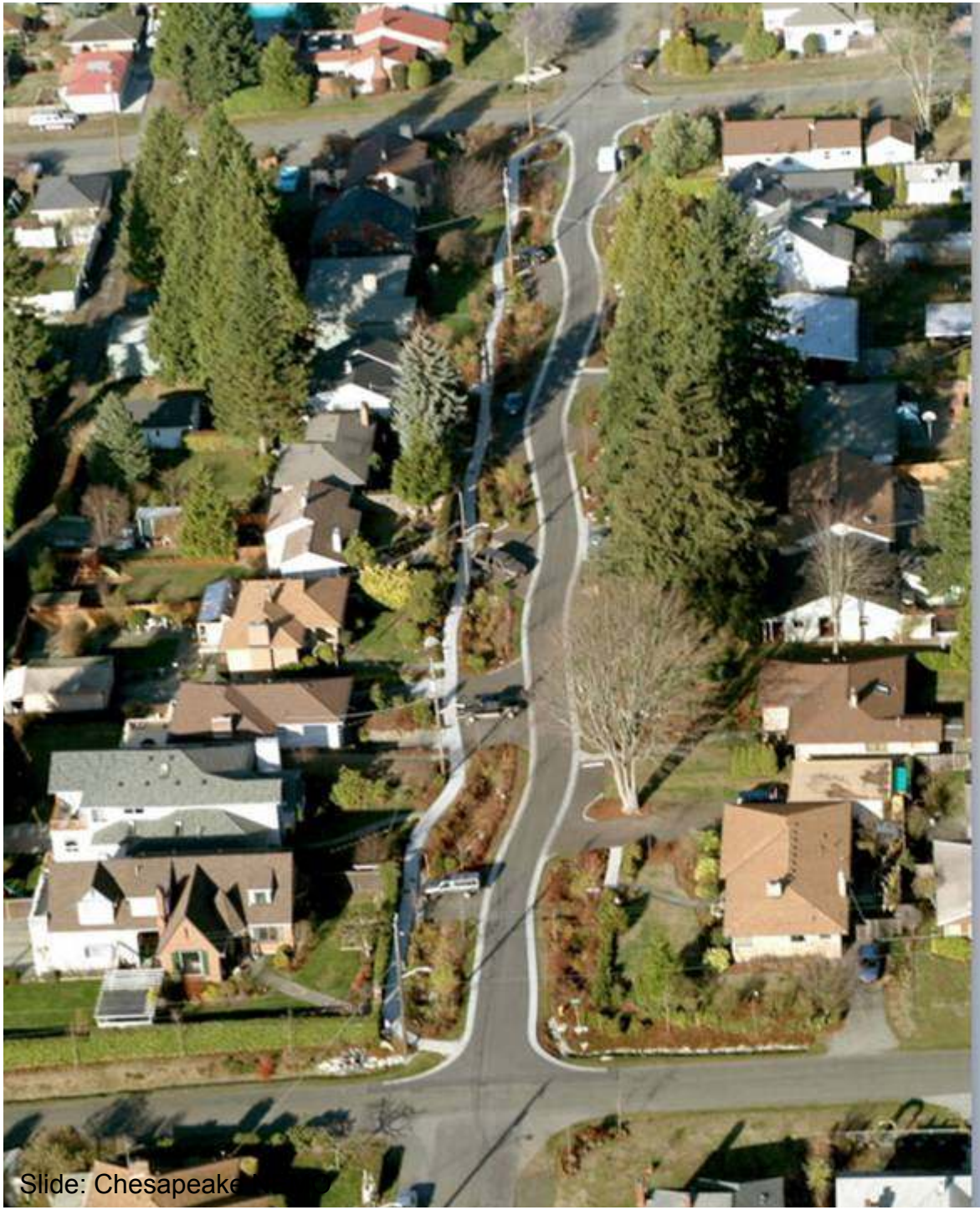
As an alternative to conventional residential subdivision design, the purpose of cluster subdivision design is to protect important components of the natural and cultural environment while encouraging quality residential neighborhood design. The primary mechanism to accomplish this purpose is the reduction of individual lot sizes and dimensional standards, with the balance of land set aside into a common open space.

Open Space Developments



- same number of housing units
- 10-50% less impervious surface
- up to 50% open space
- water resources protected

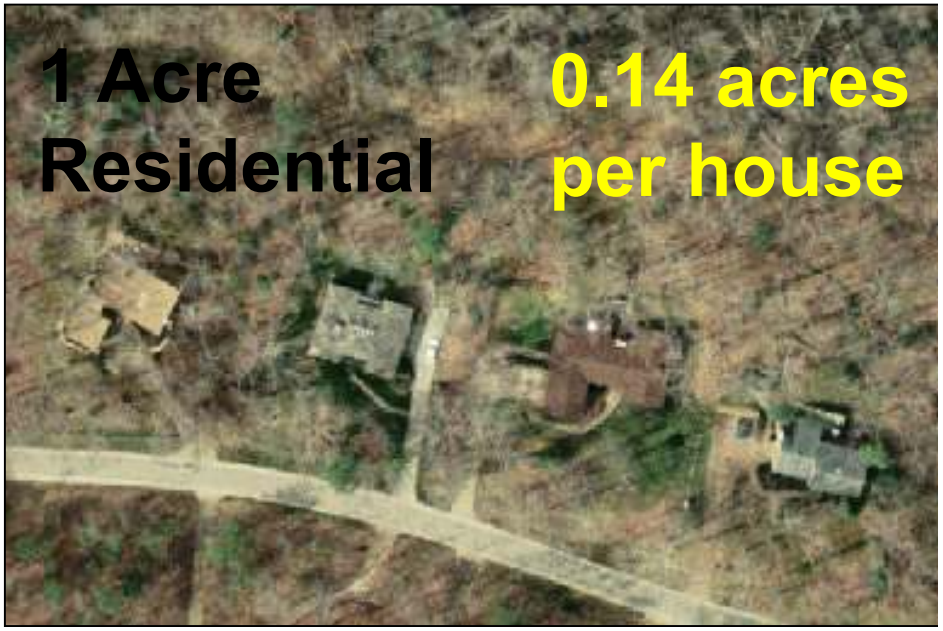
From Randall Arendt



25% Savings

Slide: Chesapeake

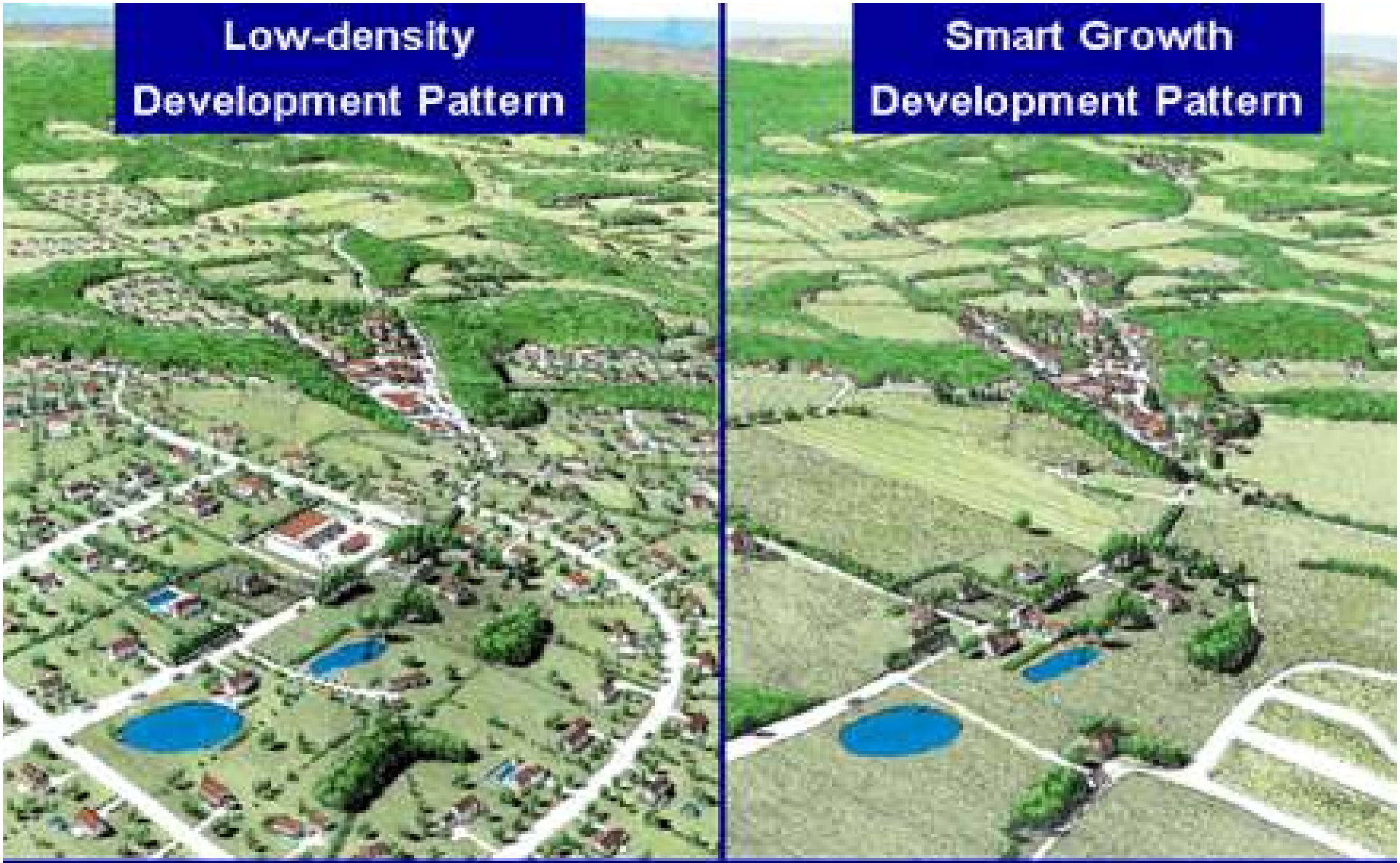

•Density bonus increases the land value
•Lower cost of development with lower infrastructure needs
•Remaining property is protected permanently
Why would a landowner want to do this?



½ Acre
Residential

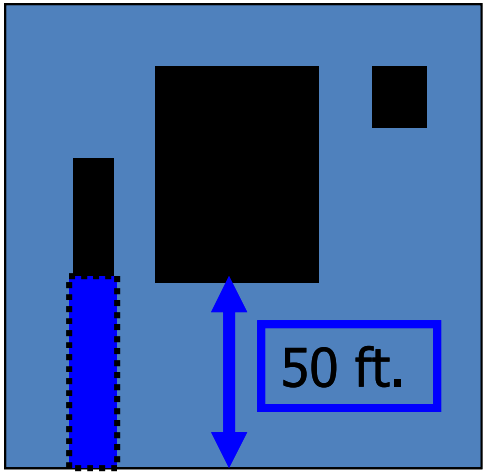
0.11 acres
per house


Connectivity to existing natural areas and trail systems means that lots are more attractive to buyers
Retaining buffers and protecting water quality means that everyone in town benefits

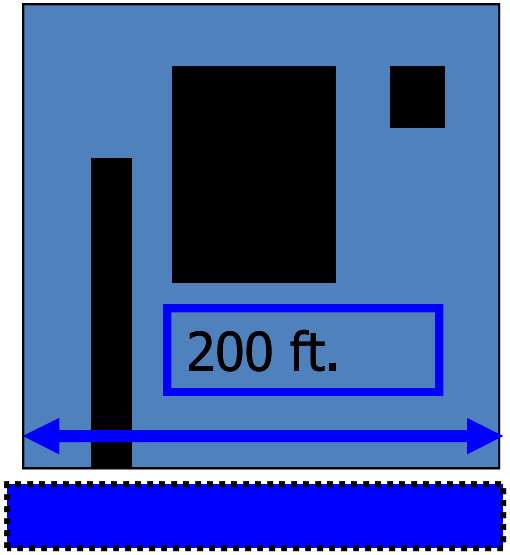


Two alternatives for future growth at a regional scale. The same number of people are accommodated in both scenarios.

Requirements for building placement



Setbacks



Frontage

Do Your Regulations Promote Imperviousness?

In Summary

To minimize impacts from excessive runoff and polluted stormwater, municipal ordinances should be modified to:

- **Retain the natural landscape as much as possible by incorporating the concept of cluster development**
- **Reduce impervious surfaces to the maximum extent possible by incorporating requirements for more vegetated areas as well as pervious pavement or concrete**
- **Emphasize on-site drainage of stormwater using rain gardens, infiltration areas and green roofs**
- **Encourage riparian buffers**
- **Require stormwater management plans for development projects**

The Department can provide technical assistance to municipalities who would like to modify their ordinances to incorporate Low Impact Development standards. For more information Please contact Bill Laflamme at: 215-9237

www.maine.gov/dep